June 2016

Hello! I am Danette Salinas and I teach Advanced Math 8. I'd like to tell you a little bit about myself and the purpose of this summer work packet. I was raised in Pismo Beach, California and I graduated Fresno Pacific University with a degree in Mathematics. I have been teaching math at Clark Intermediate for 20 years. I am married and have three children (Kendra – junior at Clovis High School, Brenna – 8th grade at Clark, and Jed – 3rd grade at Dry Creek). I look forward to this upcoming school year as I take you through the 9th grade math standards in preparation for Math 2 at Clovis High School.

I have identified some key concepts that students need to understand in order to be successful in Advanced Math 8. I expect all students entering Advanced Math 8 to have a strong foundation in working with integers (positive and negative numbers), fractions, percent, and solving multiple step equations. I have also found that students that are successful in Advanced Math 8 have a firm understanding of slope-intercept linear equations and solving systems of equations as well as an introduction to Pythagorean Theorem. Attached you will find a summer work packet to help you gain a good grasp on these concepts. While there are examples of most concepts in the packet, you may also want to look at some of the websites listed below for additional tutorials.

I expect this work packet to be completed by Wednesday, August 24, 2016. You will have a quiz on the information in this packet. The review at the end of the packet will give you a good idea of what to expect on the quiz. If you have questions or need further explanation on anything in this packet, feel free to email me (information below).

Helpful websites:

www.khanacademy.org
www.youtube.com
www.mathtv.com (Just click on a person, try multiple people's explanations if needed)
- Algebra: Linear Equations in two variables (graph, slope, etc)
- Algebra: Systems of Equations – graphing, addition method
- Geometry: The Pythagorean Theorem – solve for x

Enjoy your summer,

Danette Salinas
Advanced Math 8 Teacher
Clark Intermediate School
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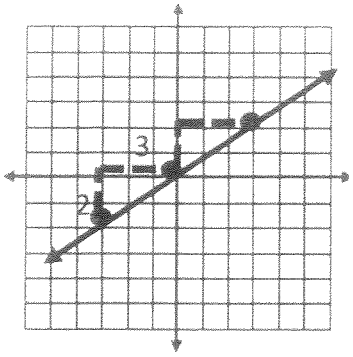
Slope

You can find slope from a line, equation, two points, or a table.

Examples:

Line: do $\frac{\text{rise}}{\text{run}}$

$\frac{\text{rise}}{\text{run}} = \boxed{\frac{2}{3}}$



Equation: look for coefficient of x

$y = 3x - 2$

slope $= \boxed{3}$

Two points: do $\frac{y_2 - y_1}{x_2 - x_1}$

(3,-5) and (7,2) → $\frac{2 - -5}{7 - 3} = \boxed{\frac{7}{4}}$

Table: find $\frac{\Delta y}{\Delta x} = \frac{\text{change of y}}{\text{change of x}}$

	x	y	
	-2	0	
-2	-4	3	+3
-2	-6	6	+3
-2	-8	9	+3

$\frac{\text{change of y}}{\text{change of x}} = \boxed{\frac{3}{-2}}$

Find the slope of each:

1. $y = \frac{1}{2}x + 7$

2. $y = -4x - 2$

3. $y = \frac{-3}{4}x + 1$

4. (4,3) and (-5,2)

5. (-8,-1) and (12,5)

6. (2,1) and (7,-4)

7.

x	y
-6	2
-3	6
0	10
3	14

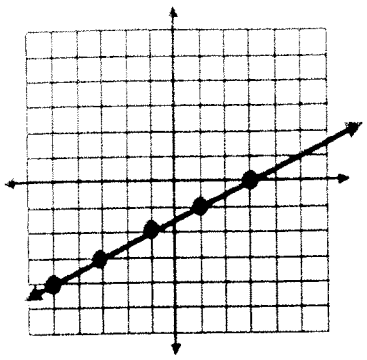
8.

x	y
0	5
2	6
4	7
6	8

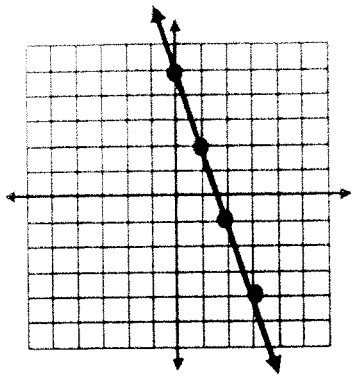
9.

x	y
0	8
1	6
2	4
3	2

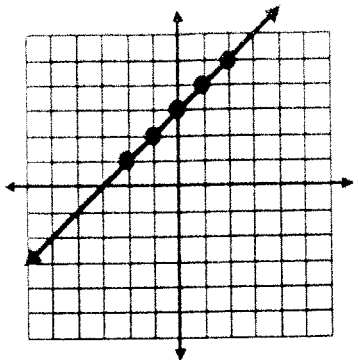
10.



11.

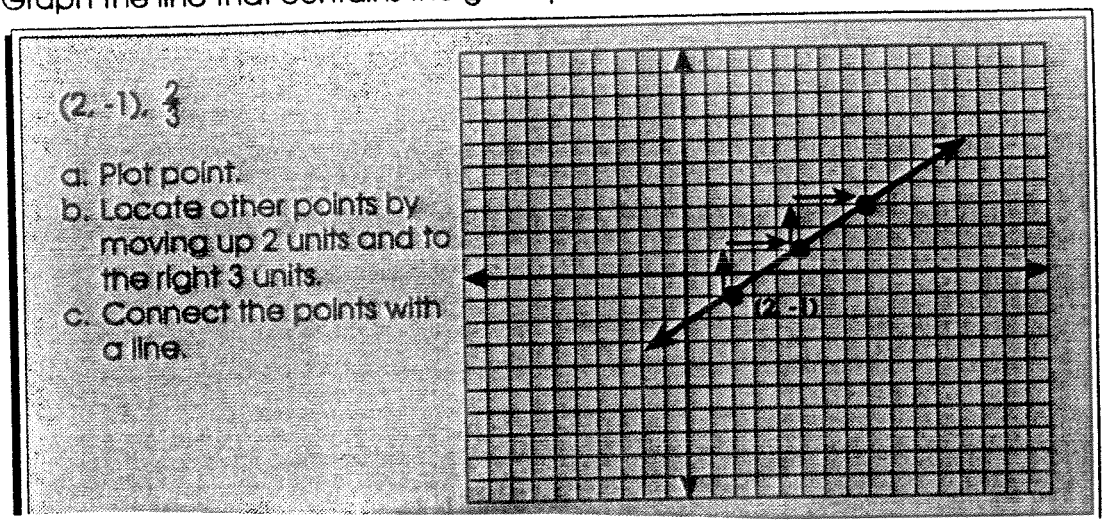


12.

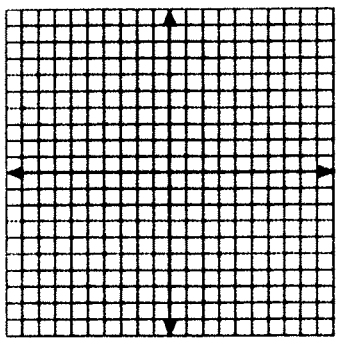


Graphing Linear Equations Using Slope

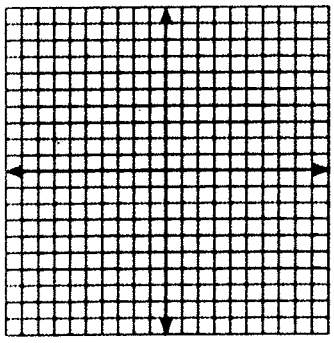
Graph the line that contains the given point and has the given slope.



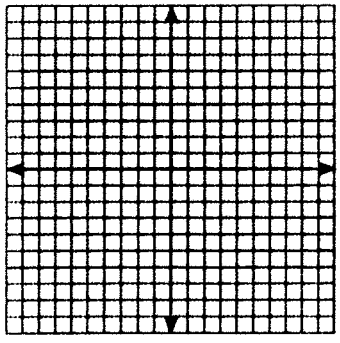
1. (-5, -2), $-\frac{1}{2}$



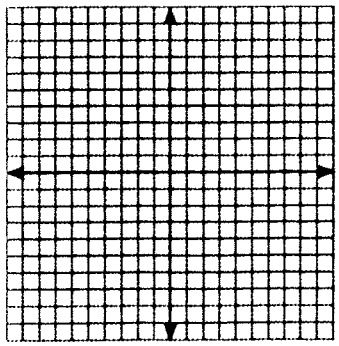
3. (2, -3), $\frac{3}{4}$



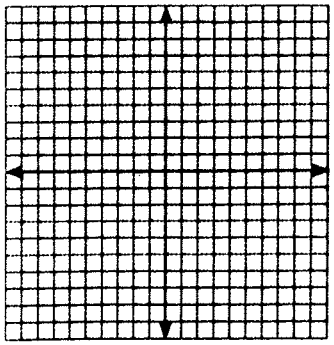
5. (-1, -4), $-\frac{1}{4}$



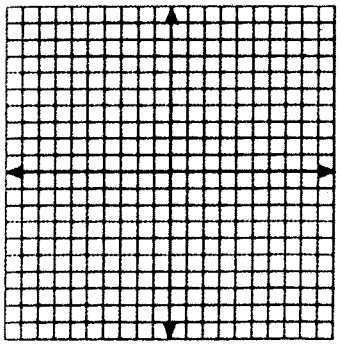
2. (4, 2), 3 (note: $3 = \frac{3}{1}$)



4. (0, 2), $-\frac{5}{2}$



6. (3, -2), -2



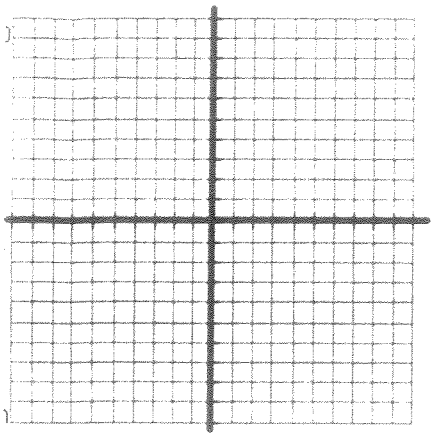
Math 8
Desmos lesson

Name _____

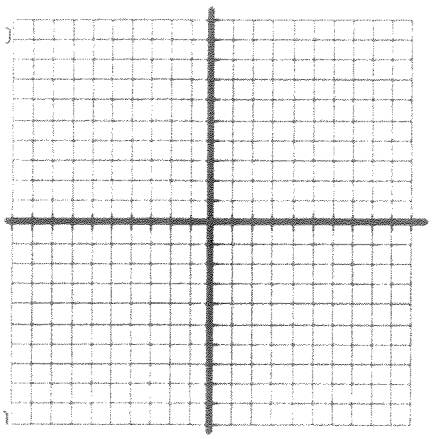
Go to Desmos.com. Launch the calculator.
Set the minimum to: -10. Set the maximum to: 10.

Graph the following:

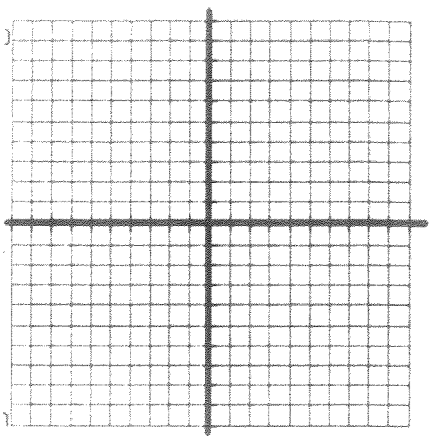
1. $y = x$



2. $y = x - 2$



3. $y = x + 3$



4. How is $y = x - 2$ different from $y = x$? _____

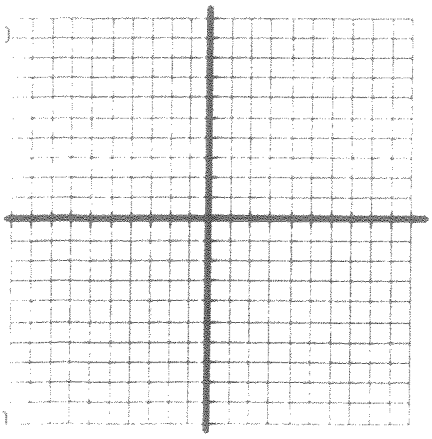
5. How is $y = x + 3$ different from $y = x$? _____

6. Notice that the graph of $y = x$ goes through (0,0). Do the graphs of $y = x - 2$ and $y = x + 3$ go through (0,0)? Why or why not?

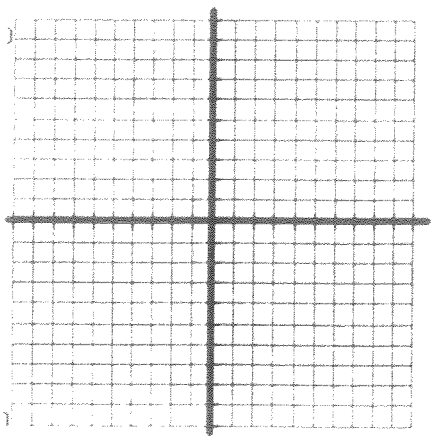
_____

Graph the following:

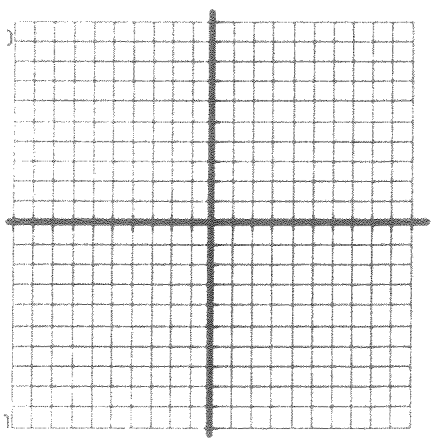
7. $y = -x$



8. $y = -x + 4$



9. $y = -x - 3$



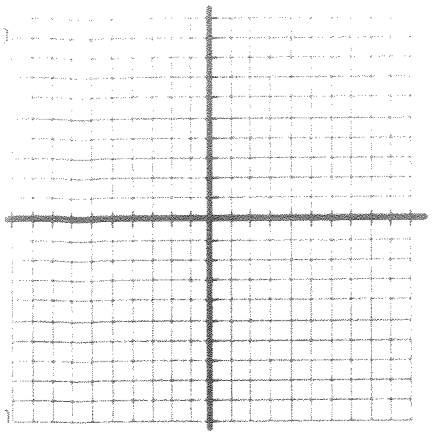
10. How is $y = -x + 4$ different from $y = -x$? _____

11. How is $y = -x - 3$ different from $y = -x$? _____

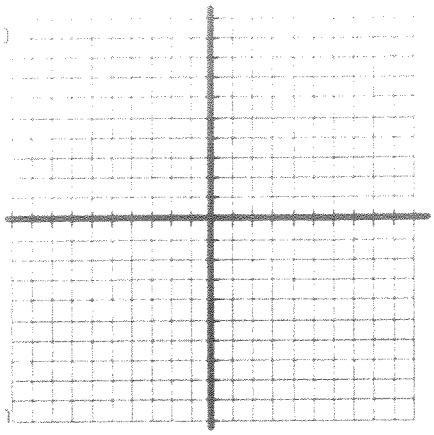
Continue on the back

Graph the following:

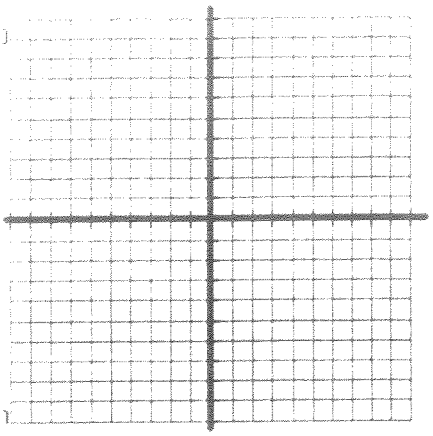
12. $y = x + 1$



13. $y = 2x + 1$



14. $y = 3x + 1$

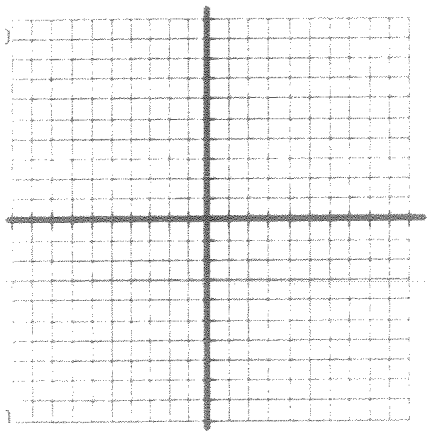


15. Which point does each line go through? (____, ____) Why? _____

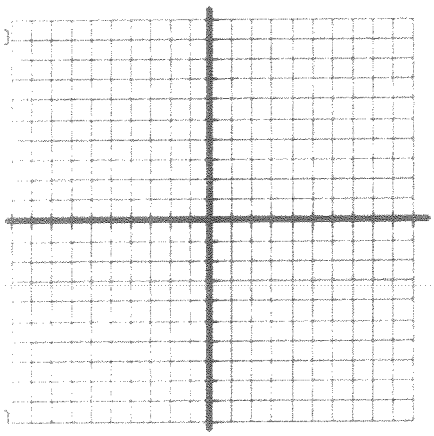
16. What is the difference between each of the lines? _____
Why? _____

Graph the following:

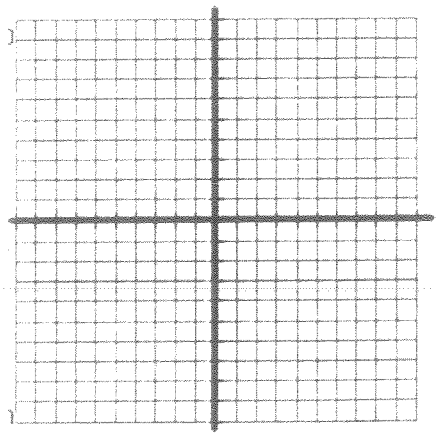
17. $y = -x + 4$



18. $y = -2x + 4$



19. $y = -3x + 4$

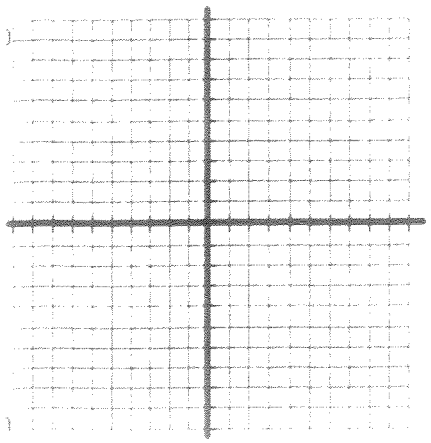


20. Which point does each line go through? (____, ____) Why? _____

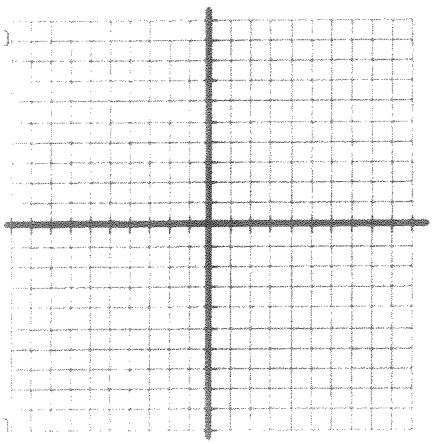
21. What is the difference between each of the lines? _____
Why? _____

Try to graph the following lines on your own. Then check them on the graphing calculator (desmos).

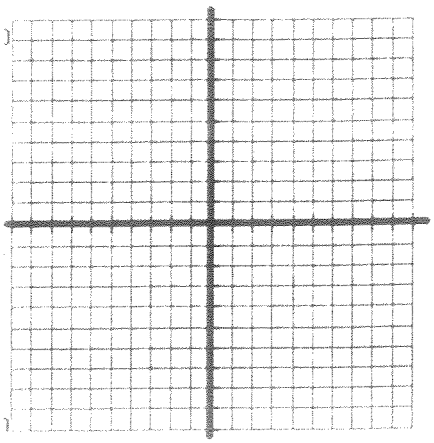
22. $y = x + 5$



23. $y = -x - 3$



24. $y = 2x - 4$



Graphing Linear Equations Using y-Intercept and Slope

Graph the lines given the equation using the y-intercept and slope.

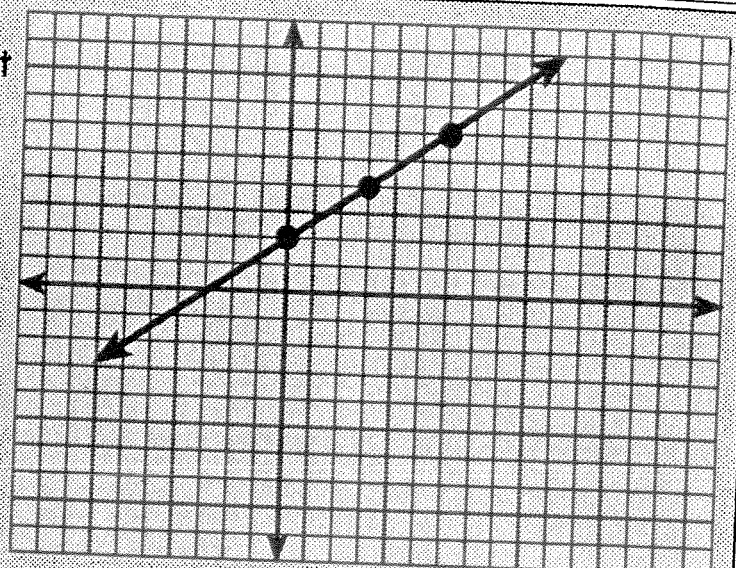
$y = mx + b$ m = slope, b = y-intercept

$y = \frac{2}{3}x + 2$

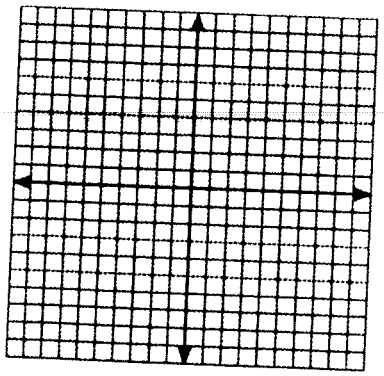
m = slope = $\frac{2}{3}$

b = y-intercept = (0, 2)

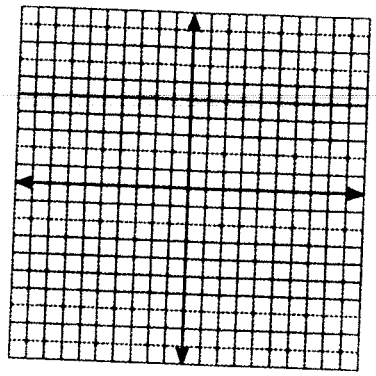
a. Plot y-intercept.
b. Locate other points using slope.
c. Connect the points with a line.



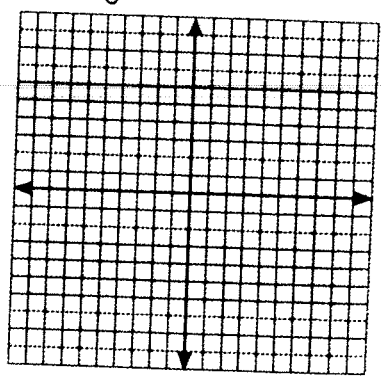
1. $y = \frac{1}{2}x - 1$



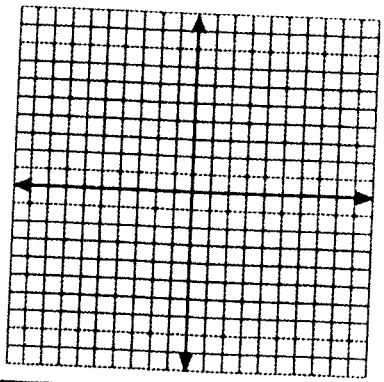
3. $y = -\frac{1}{3}x + 2$



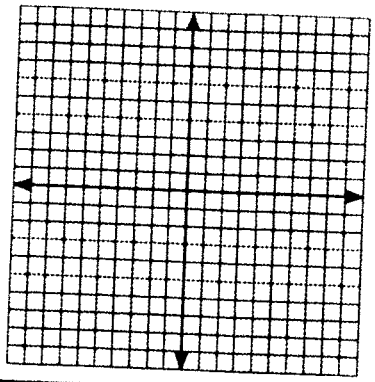
5. $y = -\frac{2}{3}x + 4$



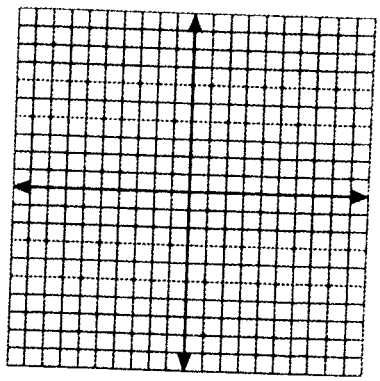
2. $y = 2x + 5$



4. $y = -3x - 1$

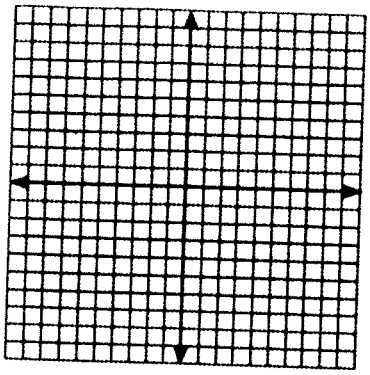


6. $y = x + 3$

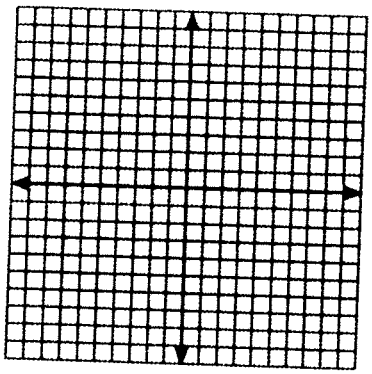


Ordered Pairs and Graphing

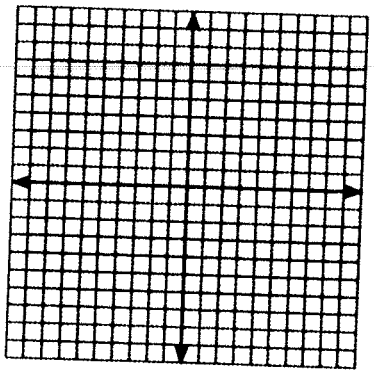
1. $y = \frac{1}{2}x - 3$



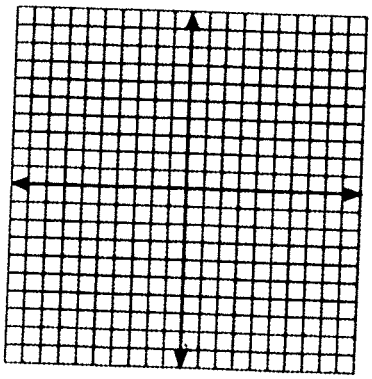
2. $-2x + y = 5$



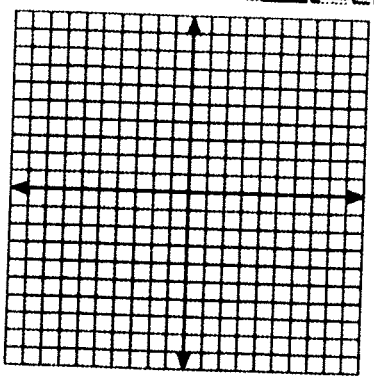
3. $4x + y = -7$



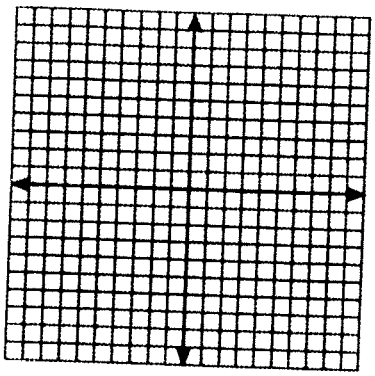
4. $y - 3 = 2x$



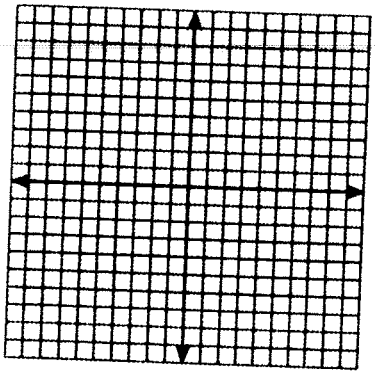
5. $3x + y = 7$



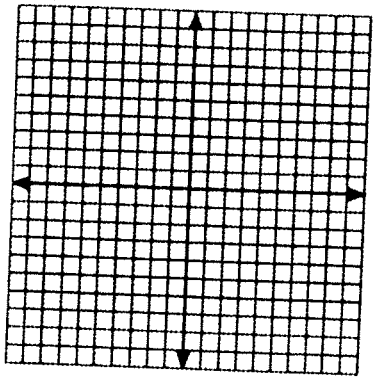
6. $3x - y = -2$



7. $y + 7 = 5x$



8. $y = \frac{1}{4}x - 2$



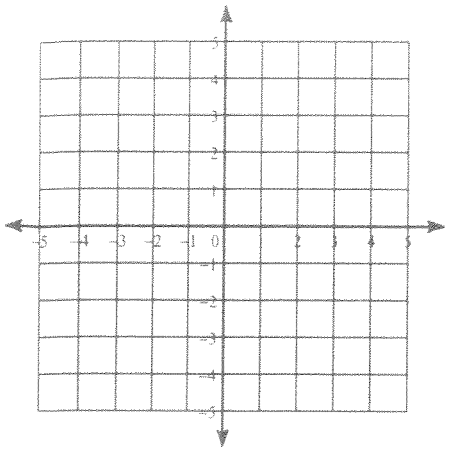
Worksheet Name _____

Solving Systems of Equations by Graphing

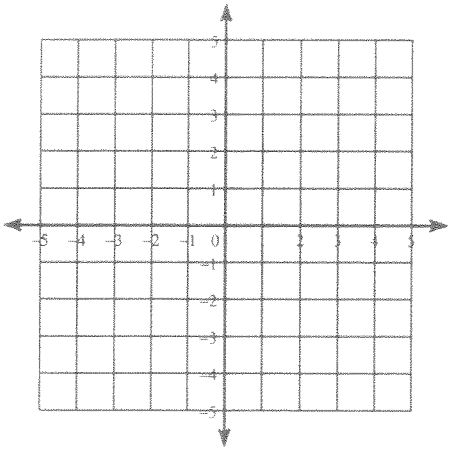
Date _____

Solve each system by graphing (find the point of intersection of the two lines) .

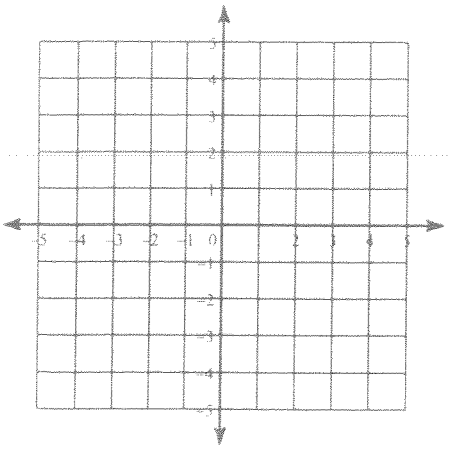
1) $y = 2x - 3$
$y = -3x + 2$



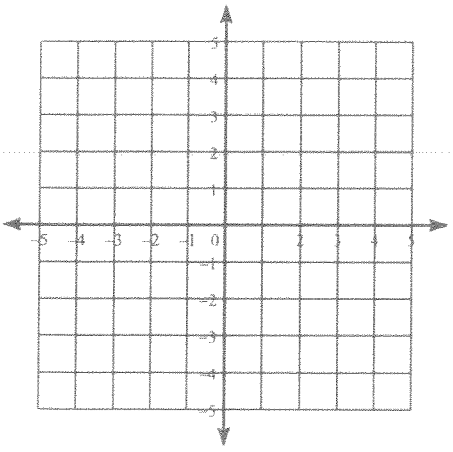
2) $y = -\frac{5}{3}x + 1$
$y = -\frac{1}{3}x - 3$



3) $y = -x + 1$
$x = 3$

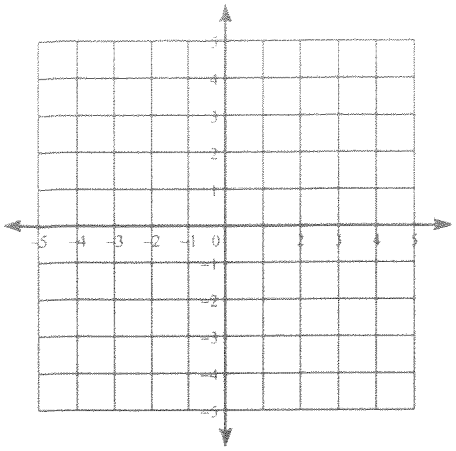


4) $y = 4x + 1$
$y = x - 2$



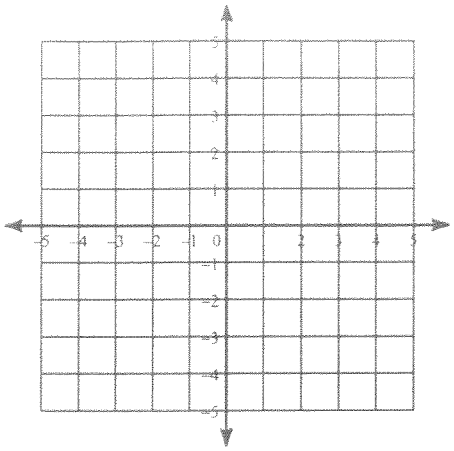
5) $y = -\frac{1}{3}x + 2$

$y = -2x - 3$



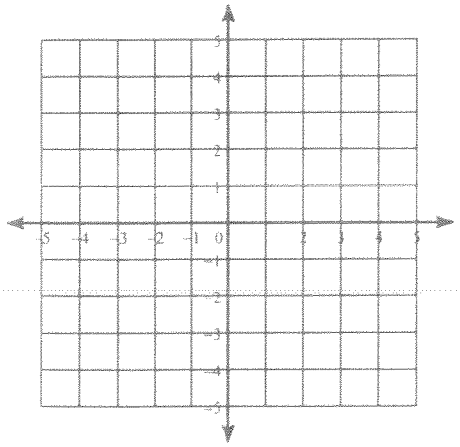
6) $y = -\frac{1}{4}x + 3$

$y = -\frac{3}{2}x - 2$



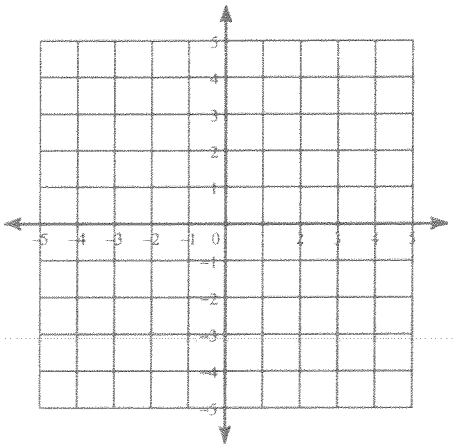
7) $y = \frac{4}{3}x - 3$

$y = 1$



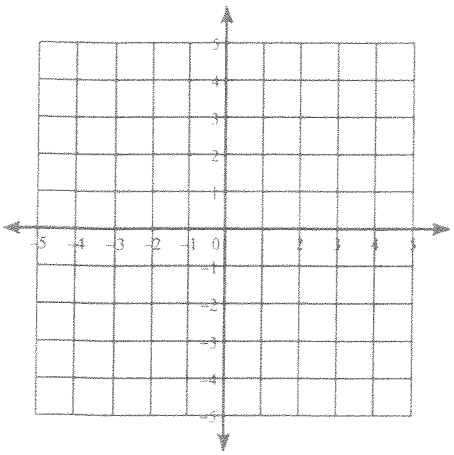
8) $y = -2x - 4$

$y = 4x + 2$



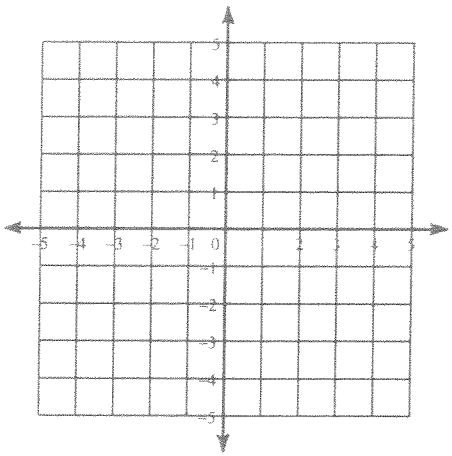
9) $y = -\frac{3}{2}x + 4$

$y = \frac{3}{2}x - 2$



10) $y = 2x - 4$

$y = \frac{1}{4}x + 3$



Adv Math 8 Summer Work Name _____

Systems of Equations – Elimination Method

Another method for solving systems of equations is the **elimination** method. You eliminate on variable when combining the equations and solve for the remaining variable. Once it is found, you use it to solve for the other variable through substitution.

Example:

$x + y = 10$
$x - y = 2$ ⟶

$x + y = 10$
$x - y = 2$ Combine equations to eliminate
$2x = 12$ Continue to solve for remaining variable
$\div 2 \quad \div 2$
$x = 6$

Use that answer to solve for the remaining variable, y, through substitution. Use either of the original equations to do this.

$x + y = 10$ ⟶

$(6) + y = 10$
$-6 \quad -6$
$y = 4$

So the one solution for this system of equations is **(6, 4)**

Solve the system of equations using the elimination method.

1. $x + y = 6$
   $x - y = 12$

2. $6x - 3y = 6$
   $3x + 3y = 3$

3. $2x + y = 14$
   $2x - y = 10$

4. $x + y = 8$
   $-x + 2y = 7$

5. $x + y = 6$
   $-x + 3y = -2$

6. $4x - y = 1$
   $3x + y = 13$

7. $5x - 6y = -32$
   $3x + 6y = 48$

8. $5x + 2y = 13$
   $-5x + y = 2$

9. $2x - 6y = -12$
   $-2x - 2y = -4$

10. $-x + y = 12$
$x - y = 3$

11. $2x - y = 9$
$4x + y = 3$

12. $3x + 4y = 4$
$-10x - 4y = -32$

Some elimination problems require you to multiply a factor with one (or both) of the original equation(s) in order to solve. After multiplying, you will be able to eliminate one variable when combining the equations and solve for the remaining variable. Once it is found, you use it to solve for the other variable through substitution.

Example: $x + y = -7$ $\quad -1(x + y = -7)$ Distribute $\quad -x - y = 7$
$3x + y = -9$ $\quad 3x + y = -9$ $\quad 3x + y = -9$

$-x - y = 7$ Combine equations to eliminate
$3x + y = -9$
$2x = -2$ Continue to solve for remaining variable using inverse operations
$\div 2 \quad \div 2$
$x = -1$

Use that answer to solve for the remaining variable, y, through substitution. Use either of the original equations to do this.

$x + y = -7$ $\quad (-1) + y = -7$
$+1 \quad +1$
$y = -6$

So the one solution for this system of equations is **(–1, –6)**

Solve the system of equations using the elimination method.

13. $-x - y = 8$
$2x - y = -1$

14. $x + y = -7$
$3x + y = -9$

15. $x + 5y = 14$
$4x - 2y = 12$

16. $-3x + 3y = 0$
$x - y = 4$

17. $x + y = 4$
$-2x + y = 1$

18. $4x + 3y = 18$
$2x + 5y = -12$

19. $6x + y = -2$
$3x + y = 1$

20. $4x + 2y = 2$
$3x + y = 4$

21. $-x + y = -8$
$-2x + y = -14$

22. $2x - 5y = 1$
$x - 2y = 2$

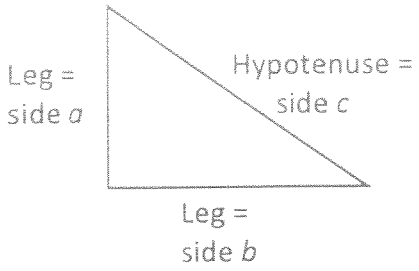
23. $-2x + 9y = -1$
$x - 5y = 1$

24. $6x + 3y = 24$
$3x + y = 10$

Advanced Math 8 Summer Work
Pythagorean Theorem

Name _____

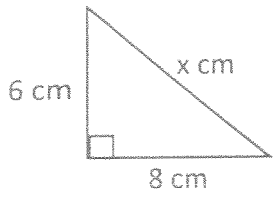
The Pythagorean Theorem is used to find the missing side lengths of right triangles.



Pythagorean Theorem: $a^2 + b^2 = c^2$

Use the Pythagorean Theorem to find the missing side lengths. You may use a calculator. If necessary, round answers to the nearest tenth.

1.



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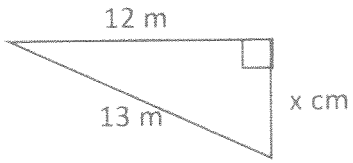

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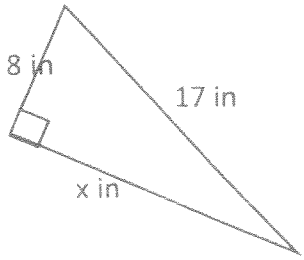

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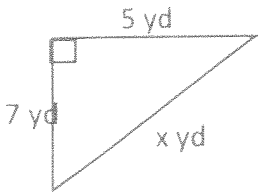

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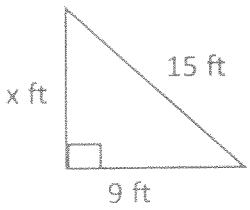

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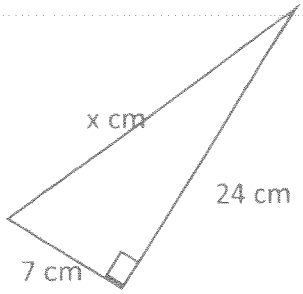

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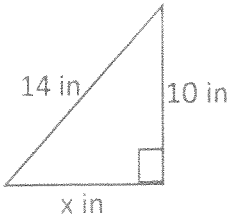

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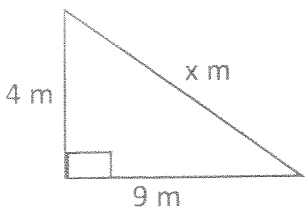

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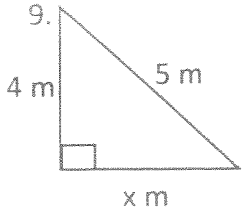


Advanced Math 8 Summer Work Name _____

Final Review: Are you ready for Advanced Math 8?

Find the slope of the line through these points:

1. (6,3) and (8,7)

2. (-4,11) and (5, -6)

1, _____

2. _____

State the slope and y-intercept:

3. $y = -6x + 12$

4. $3x + y = 7$

5. $4x - 2y = 10$

3. Slope = _____
y-intercept = _____

4. Slope = _____
y-intercept = _____

5. Slope = _____
y-intercept = _____

Write the equation of a line in slope-intercept form (y=mx + b):

6. through (2,4) and has a slope of 5

6. _____

7. through (-3,1) and (6,4)

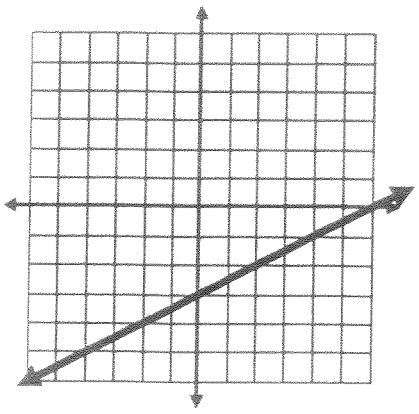
7. _____

8. A driver's training school charges $40 per lesson and $55 for insurance. Write an equation in slope-intercept form (y=mx + b) to represent this situation.

8. _____

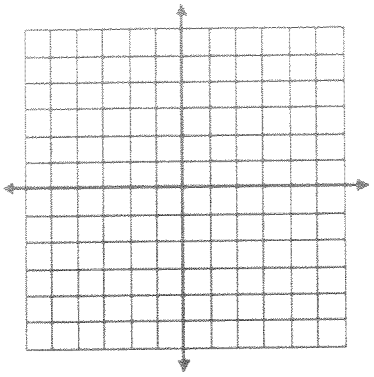
9. Write the equation of the line in slope-intercept form:

9. _____

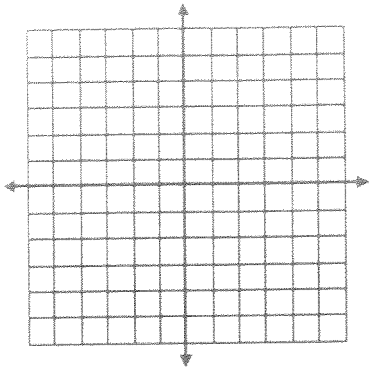


Graph the following:

10. $y = -2x + 5$



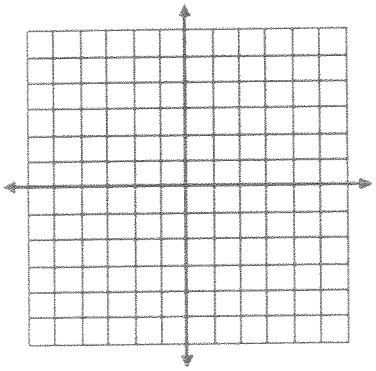
11. $-3x + 9y = -18$



Solve the following using graphing. (Hint: Find the point of intersection)

12. $5x - 2y = 12$
$3x + 2y = 4$

12. _____



Solve the following using the elimination method. Hint: answers should look like ordered pairs (x, y)

13. $2x + 2y = 6$
$6x + y = -7$

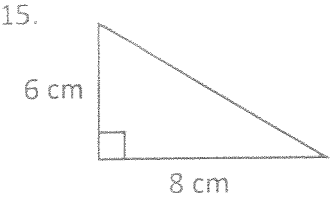
14. $3x + 2y = 18$
$7x + 3y = 32$

13. _____

14. _____

Find the missing side length: (Hint: use the Pythagorean Theorem)

15.



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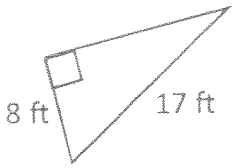

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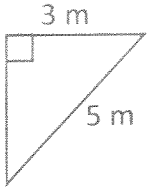

15. _____

16. _____

17. _____